

Name:

Solutions

1. Alexis deposited \$1,000 in an interest-bearing savings account for five years. The annual interest rate is 5%, and the interest is compounded one time at the end of each year. What will be the future value of the investment at the end of the five-year investment period?

$$A(t) = A_0 \left(1 + \frac{r}{k}\right)^{tk}$$
$$A(5) = 1000 \left(1 + \frac{0.05}{1}\right)^{5(1)} \approx \$1,276.28$$

2. Isaiah deposited \$2,000 in an interest-bearing savings account for ten years. The annual interest rate is 6%, and the interest is compounded monthly. What will be the future value of the investment at the end of the ten-year investment period?

$$A(10) = 2000 \left(1 + \frac{0.06}{12}\right)^{(10)(12)} \approx \$3,638.79$$

3. Anasia deposited \$3,000 in an interest-bearing savings account for fifteen years. The annual interest rate is 7%, and the interest is compounded weekly. What will be the future value of the investment at the end of the fifteen-year investment period?

$$A(15) = 3000 \left(1 + \frac{0.07}{52}\right)^{(15)(52)} \approx \$8,566.90$$

4. Elijah deposited \$4,000 in an interest-bearing savings account for twenty years. The annual interest rate is 8%, and the interest is compounded daily. What will be the future value of the investment at the end of the twenty-year investment period?

$$A(20) = 4000 \left(1 + \frac{0.08}{365}\right)^{(20)(365)} \approx \$19,808.66$$

5. Kayla deposited \$5,000 in an interest-bearing savings account for twenty-five years. The annual interest rate is 4%, and the interest is compounded continuously. What will be the future value of the investment at the end of the twenty-five-year investment period?

$$A(t) = A_0 e^{rt} \quad A(25) = 5000 e^{(0.04)(25)} \approx \$13,591.41$$

6. Reno deposited \$6,000 in an interest-bearing savings account for thirty years. The annual interest rate is 3%, and the interest is compounded every six months. What will be the future value of the investment at the end of the thirty-year investment period?

$$A(30) = 6000 \left(1 + \frac{0.03}{2}\right)^{(30)(2)} \approx \$14,659.32$$

7. Marcus deposited \$7,000 in an interest-bearing savings account for thirty-five years. The annual interest rate is 2%, and the interest is compounded monthly. What will be the future value of the investment at the end of the thirty-five-year investment period?

$$A(35) = 7000 \left(1 + \frac{0.02}{12}\right)^{(35)(12)} \approx \$14,688.06$$

8. Eboni deposited \$8,000 in an interest-bearing savings account for forty years. The annual interest rate is 9%, and the interest is compounded weekly. What will be the future value of the investment at the end of the forty-year investment period?

$$A(40) = 8000 \left(1 + \frac{0.09}{52}\right)^{(40)(52)} \approx \$29,876.20$$

9. Trent deposited \$9,000 in an interest-bearing savings account for forty-five years. The annual interest rate is 1%, and the interest is compounded daily. What will be the future value of the investment at the end of the forty-five-year investment period?

$$A(45) = 9000 \left(1 + \frac{0.01}{365}\right)^{(45)(365)} \approx \$14,114.72$$

10. Chloe deposited \$10,000 in an interest-bearing savings account for fifty years. The annual interest rate is 4.5%, and the interest is compounded continuously. What will be the future value of the investment at the end of the fifty-year investment period?

$$A(50) = 10000(e)^{(0.045)(50)} \approx \$94,877.36$$

11. Kayla has 894 mg of radium-226, a radioactive isotope, with a half-life of 1,600 years. How many grams of the isotope will be radioactive after 1,000 years have passed?

$$A(t) = A_0 \left(\frac{1}{2}\right)^{t/k}$$

$$A(1000) = 894 \left(\frac{1}{2}\right)^{\frac{1000}{1600}} \approx 579.69 \text{ mg}$$

12. Jewel has 2,305 mg of silver-108, a radioactive isotope, with a half-life of 418 years. How many mg of the isotope will be actively radioactive after 300 years have passed?

$$A(300) = 2305 \left(\frac{1}{2}\right)^{\frac{300}{418}} \approx 1,401.59 \text{ mg}$$

13. Niyjah has 1,520 mg of argon-39, a radioactive isotope, with a half-life of 269 years. How many mg of the isotope will be actively radioactive after 500 years have passed?

$$A(500) = 1520 \left(\frac{1}{2}\right)^{\frac{500}{269}} \approx 419.09 \text{ mg}$$

14. Corey deposits \$500 in an interest-bearing savings account. Over the years, he observes that his money doubles in value every 12 years. What is the value of his investment after 8 years?

$$A(t) = A_0 (2)^{t/k}$$

$$A(8) = 500 (2)^{\frac{8}{12}} \approx \$793.70$$

15. Lindsey deposits \$500 in an interest-bearing savings account. Over the years, she observes that her money doubles in value every 12 years. What is the value of her investment after 16 years?

$$A(16) = 500 (2)^{\frac{16}{12}} \approx \$1,259.92$$

16. Dana deposits \$500 in an interest-bearing savings account. Over the years, he observes that his money triples in value every 20 years. What is the value of his investment after 45 years?

$$A(45) = 500 (3)^{\frac{45}{20}} \approx \$5,922.33$$